UPPER STILLWATER RESERVOIR

Introduction

Upper Stillwater Reservoir is a large reservoir on the south slope of the High Uintas. It is the uppermost reservoir in a chain of impoundments, diversions and tunnels that
stores and divert Uinta water to Wasatch Front irrigational interests. Currant Creek and Strawberry Reservoirs are also facilities that are involved in this process that are linked together via diversion structures. The system was built by the Bureau of Reclamation as part of the Central Utah Project (CUP). Access is fairly easy, and the rolled concrete dam is an attraction for engineers. Rock Creek Campground at the reservoir is a popular trailhead into the High Uintas Wilderness, with the boundary only a mile north of the dam near the high water line for the reservoir.

Upper Stillwater Reservoir was created in 1987 by the construction of a concrete gravity dam. The reservoir shoreline is owned by the Bureau of Reclamation and the Ashley National Forest. Public access is unrestricted. Reservoir water is used primarily for recreation during the summer but it is diverted into the collection system for use

Characteristics and Morphometry

Lake elevation (meters / feet)	2,492 / 8,176
Surface area (hectares / acres)	130 / 320
Watershed area (hectares / acres)	29,012 / 71,688
Volume (m^3 / acre-feet)	
capacity	40,857,000 / 33,123
conservation pool	
Annual inflow (m^3 / acre-feet)	
Retention time (years)	
Drawdown (m^3 / acre-feet)	
Depth (meters / feet)	
maximum	51 / 167
mean	31.6 / 103.5
Length (m / feet)	2,134 / 7,000
Width (m / feet)	610 / 2,000
Shoreline (m / feet)	5,486 / 18,000

Location

County	Duchesne
Longitude / Latitude	110 41 57 / 40 33 43
USGS Map	Tworoose Pass, Ut 1967
DeLorme's Utah Atlas & Gazetteer™	Page 55, C-4
Cataloging Unit	Duchesne 14060003

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downstream later in the year. It is estimated that at least twice the storage capacity of the reservoir will be diverted towards the Wasatch Front annually.

Although the primary use on the wasatch front is for irrigation, water will be used for power production and consumption as facilities are constructed and the demand for culinary water increases.

Recreation

Upper Stillwater Reservoir is easily accessible from U-87 near Mountain Home. From Mountain Home take FR-134, an asphalt surface road, proceeds west from the city. Travel for approximately 22 miles in a northwest direction to reach the reservoir. FR-134 continues past the reservoir to U-35 just north of Hanna, a distance of approximately 12 miles on a gravel road. At the reservoir an access road leads across Rock Creek below the dam and up the east slope to the boat launching area at the reservoir. A trailhead into the wilderness area north of the reservoir is on the western side of the reservoir.

Fishing, boating, swimming, camping, picnicking, and hiking are all popular activities. The area is directly adjacent to the wilderness area and offers a unique experience for those recreating in the area.

Recreational facilities near the reservoir include public campgrounds and some private recreational opportunities. There are numerous USFS campgrounds in route to the reservoir in addition to the one located adjacent to the reservoir.

Watershed Description

Upper Stillwater Reservoir is located at the edge of the Uinta Mountains on the edge of the wilderness area. It is an impoundment of Rock Creek which originates near the summit to the Uinta Mountains. It is an impoundment of a deep glacial valley on the south slope of the High Uintas.

The valley is about 0.5 miles wide and up to 2,300 feet deep, with slopes of 50 - 100%. It is narrow and deep, the result of tens of square miles of glaciers all flowing out the Rock Creek. This valley is morphologically similar to many others along the south slope, including the Duchesne River, Lake Fork, Yellowstone River and Uinta River. The valley walls are thickly forested, and beyond the reservoir are permanently protected as part of the High Uintas Wilderness.

The watershed high point, Ostler Peak , is 3,876 m (12,717 feet) above mean sea level, creating a complex slope of 7.2% to the reservoir. The principle inflow and outflow is Rock Creek, however, water from the south fork of Rock Creek can be diverted into the reservoir. The average stream gradient above the lake is 4.4% (232 feet per mile).

The watershed is primarily the Uinta Mountains, stretching from the reservoir to the ridgeline. Much of the area is made up of relatively flat, forested areas interspersed with lakes and meadows. These areas are where glaciers left uneven terrain as they flowed, and deposited piles of moraine when they melted. The glaciated area is interdigitated with the barren ridges that were not scoured by glaciers. The Rock Creek valley is near 8,600 feet elevation at the base of the reservoir, while the forests are at 9,000 to 11,000 feet in elevation, and the mountains are up to 13,000 feet elevation.

The watershed is made up of high mountains with abundant rock outcroppings. The soil associations that compose the watershed are listed in Appendix III.

The vegetation communities consist of pine, aspen, spruce-fir, and alpine tundra. The watershed receives 52 - 102 cm (20 - 40 inches) of precipitation annually. The frost-free season around the reservoir is 40 - 60 days per year.

Land use is approximately 90% wilderness, which includes recreational use by humans, grazing by animals used by recreational users, and allotment grazing by

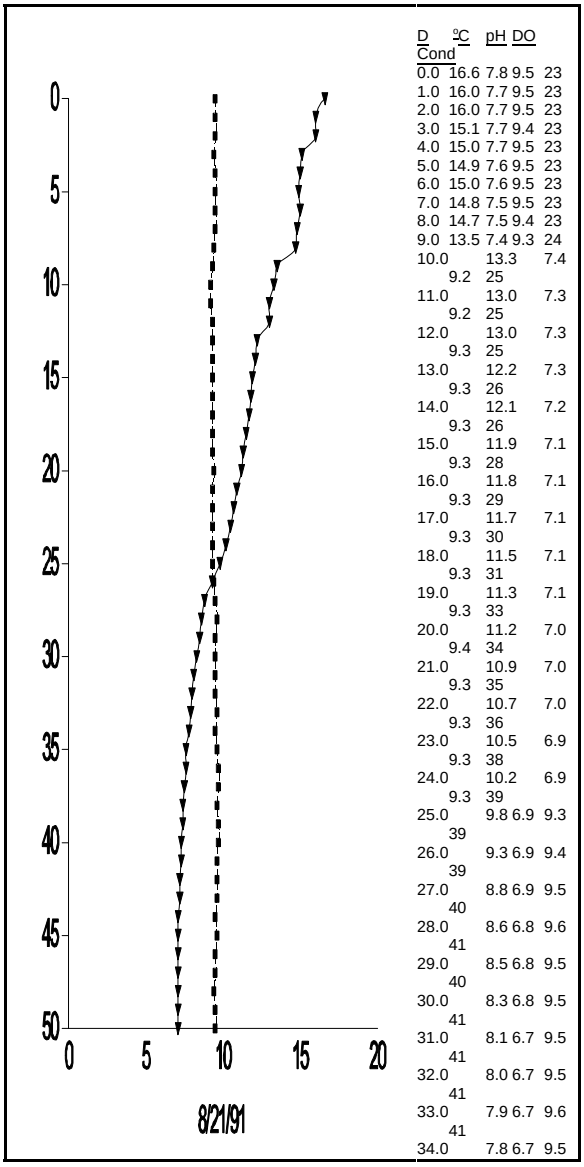
sheep and cattle. That portion of the watershed that is not wilderness is in direct proximity to the reservoir and the tributaries of the south fork of Rock Creek which can be diverted into the reservoir.

Limnological Assessment

The water quality of Upper Stillwater Reservoir is considered excellent. It is considered to be very soft with a hardness concentration value of approximately 9.3 mg/L ($CaCO_3$). There are no overall water column concentrations that exceed State water quality standards for those parameters analyzed.

Current data suggest that the reservoir is currently a nitrogen limited system. TSI values indicate the reservoir is oligotrophic in a state of low productivity. The reservoir does stratify at a depth of 8-10 meters as summer progresses as is indicated in the August 21, 1991 profile.

According to DWR no fish kills have been reported in recent years. The reservoir is stocked with 10,000 catchable rainbow trout (*Oncorhynchus mykiss*) but because it has not been chemically treated for rough fish competition, populations of native fishes may still be present in the lake. These could be populations of brook trout (*Salvelinus fontinalis*) and cutthroat trout (*Oncorhynchus clarki*). Phytoplankton in the euphotic zone include the following taxa (in order of dominance)



D	°C	pH	DO	Cond
0.0	16.6	7.8	9.5	23
1.0	16.0	7.7	9.5	23
2.0	16.0	7.7	9.5	23
3.0	15.1	7.7	9.4	23
4.0	15.0	7.7	9.5	23
5.0	14.9	7.6	9.5	23
6.0	15.0	7.6	9.5	23
7.0	14.8	7.5	9.5	23
8.0	14.7	7.5	9.4	23
9.0	13.5	7.4	9.3	24
10.0	13.3	7.4	9.2	25
11.0	13.0	7.3	9.2	25
12.0	13.0	7.3	9.3	25
13.0	12.2	7.3	9.3	26
14.0	12.1	7.2	9.3	26
15.0	11.9	7.1	9.3	28
16.0	11.8	7.1	9.3	29
17.0	11.7	7.1	9.3	30
18.0	11.5	7.1	9.3	31
19.0	11.3	7.1	9.3	33
20.0	11.2	7.0	9.4	34
21.0	10.9	7.0	9.3	35
22.0	10.7	7.0	9.3	36
23.0	10.5	6.9	9.3	38
24.0	10.2	6.9	9.3	39
25.0	9.8	6.9	9.3	39
26.0	9.3	6.9	9.4	39
27.0	8.8	6.9	9.5	40
28.0	8.6	6.8	9.6	41
29.0	8.5	6.8	9.5	40
30.0	8.3	6.8	9.5	41
31.0	8.1	6.7	9.5	41
32.0	8.0	6.7	9.5	41
33.0	7.9	6.7	9.6	41
34.0	7.8	6.7	9.5	

Limnological Data

Data averaged from STORET sites: 493550, 493551, 493552

Surface Data	1989	1991
Trophic Status	O	O
Chlorophyll TSI	41.18	34.96
Secchi Depth TSI	45.92	44.88
Phosphorous TSI	31.03	36.95
Average TSI	39.38	38.93
Chlorophyll a (ug/L)	3	1.7
Transparency (m)	2.75	3.1
Total Phosphorous (ug/L)	7	9
pH	7.2	7.2
Total Susp. Solids (mg/L)	<3	<3
Total Volatile Solids (mg/L)	-	2
Total Residual Solids (mg/L)	-	7
Temperature (°C / °f)	12/54	13/56
Conductivity (umhos.cm)	22	25
Water Column Data		
Ammonia (mg/L)	0.03	0.03
Nitrate/Nitrite (mg/L)	-	0.02
Hardness (mg/L)	10.4	8.2
Alkalinity (mg/L)	6.5	6.5
Silica (mg/L)	-	2.3
Total Phosphorous (ug/L)	9	10
Miscellaneous Data		
Limiting Nutrient	N	N
DO (Mg/l) at 75% depth	7.1	9.7
Stratification (m)	NO	NO
Depth at Deepest Site (m)	52	50

Species	Cell Volume (mm^3/liter)	% Density By Volume
Sphaerocystis schroeteri	7.923	77.29
Quadrigula lacustris	2.224	21.70
Dinobryon divergens	.083	0.81
Oocystis sp.	.017	0.16
Pennate diatoms	.003	0.03

Total	2.958
Shannon-Weaver [H']	0.58
Species Evenness	0.36
Species Richness	0.19

The phytoplankton community is dominated by the presence of green algae and diatoms indicative of good water quality and low production.

Pollution Assessment

Nonpoint pollution sources include the following: sedimentation and nutrient loading from grazing; and wastes and litter from recreational activities.

There are no point sources of pollution in the watershed.

Beneficial Use Classification

The state beneficial use classifications include: culinary water (1C), boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses

Information

Management Agencies	
Uinta Basin Association of Governments	722-4518
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146
Uinta National Forest	377-5780
Recreation	
Dinosaurland Travel Region (Vernal)	789-6932
Vernal Chamber of Commerce	789-1352
Steinaker State Park	789-4432
Mammoth R.V. Park (Vernal)	789-9309
Campground Dina (Vernal)	789-2148
Reservoir Administrators	
Department of the Interior	524-5403
CUP	226-7100

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